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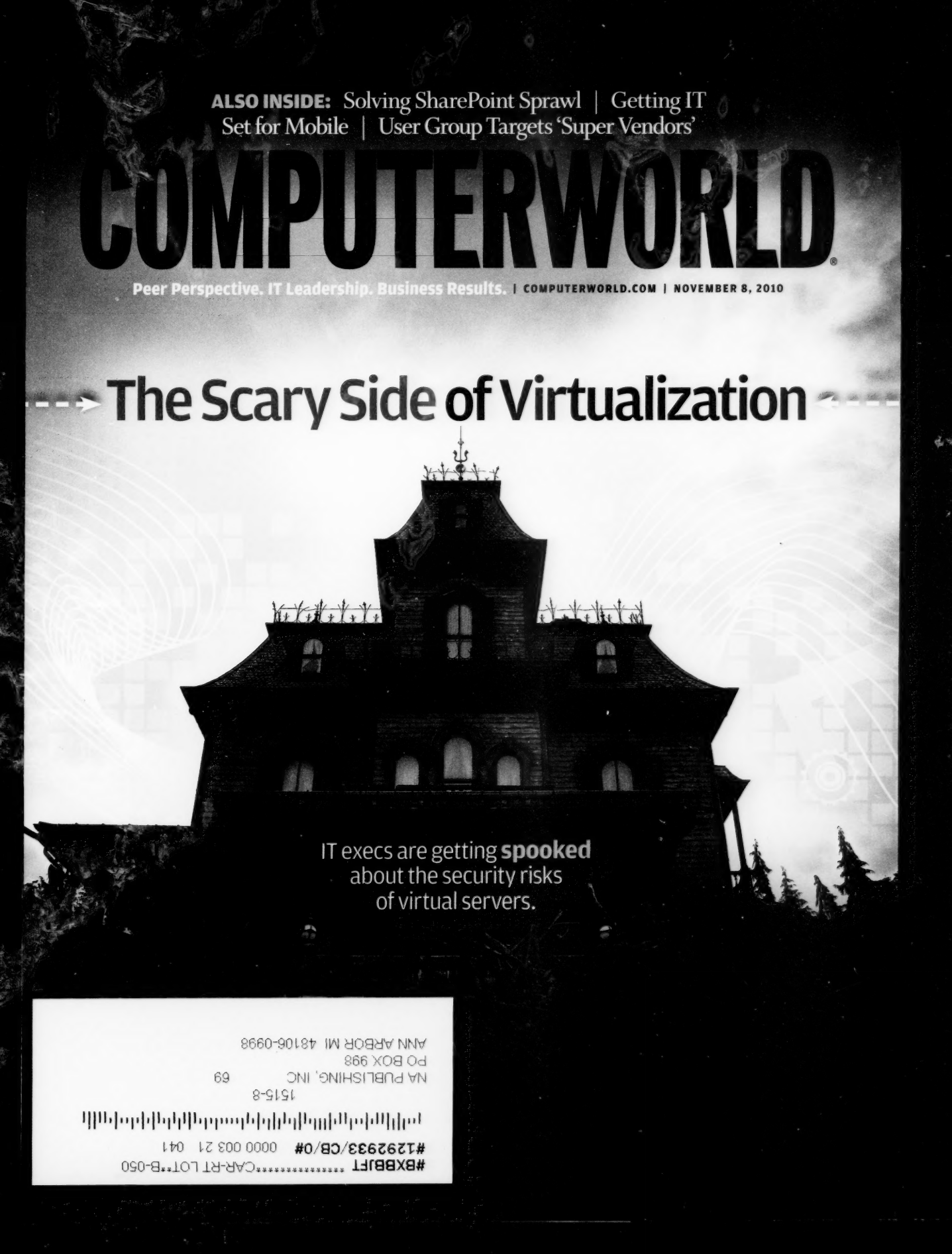
The Scary Side of Virtualization



IT execs are getting **spooked** about the security risks of virtual servers.

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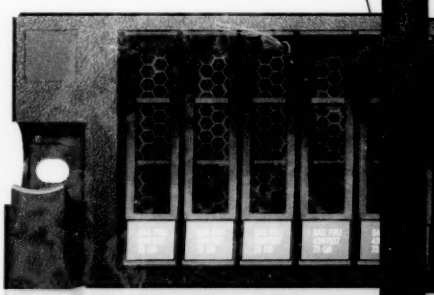

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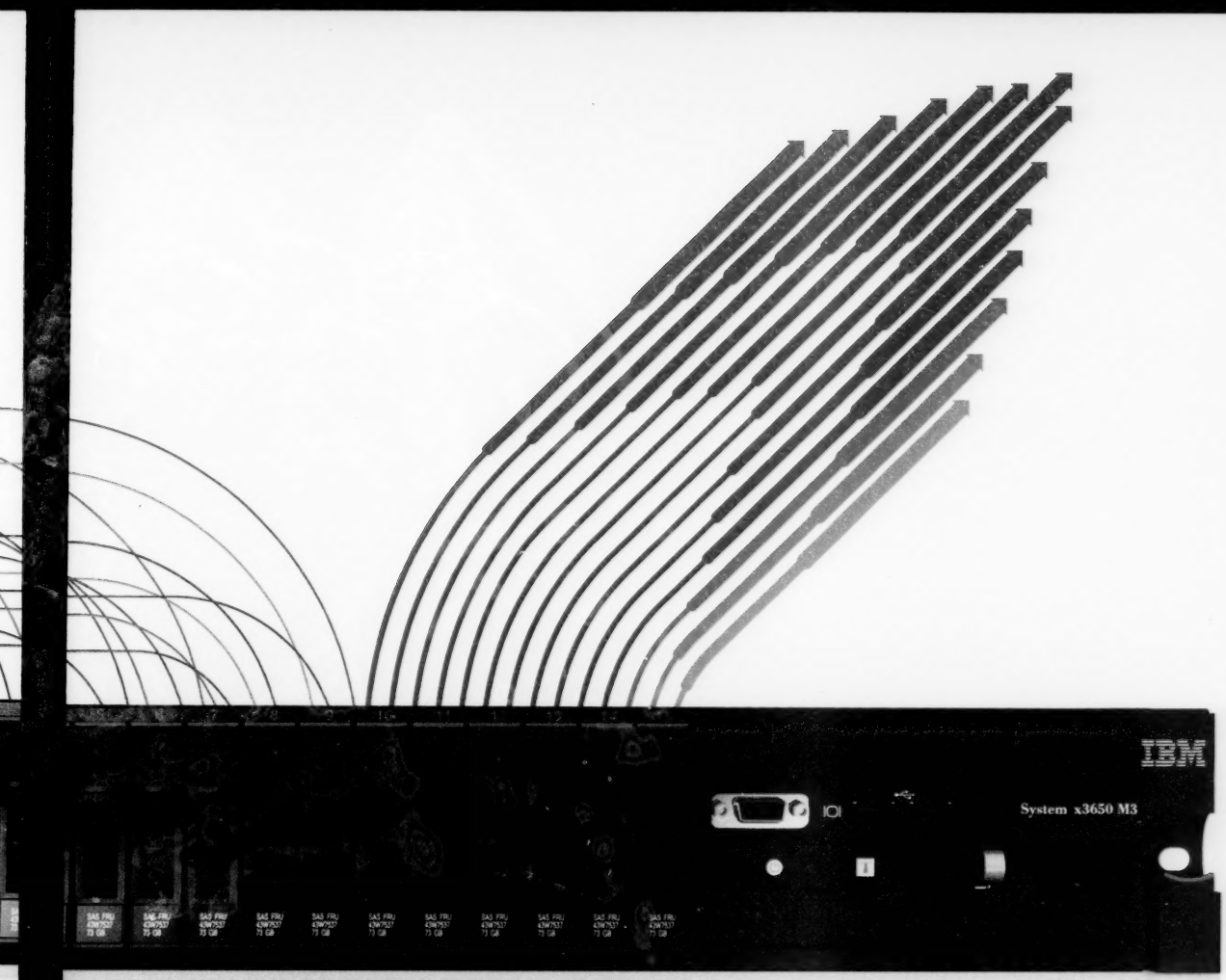

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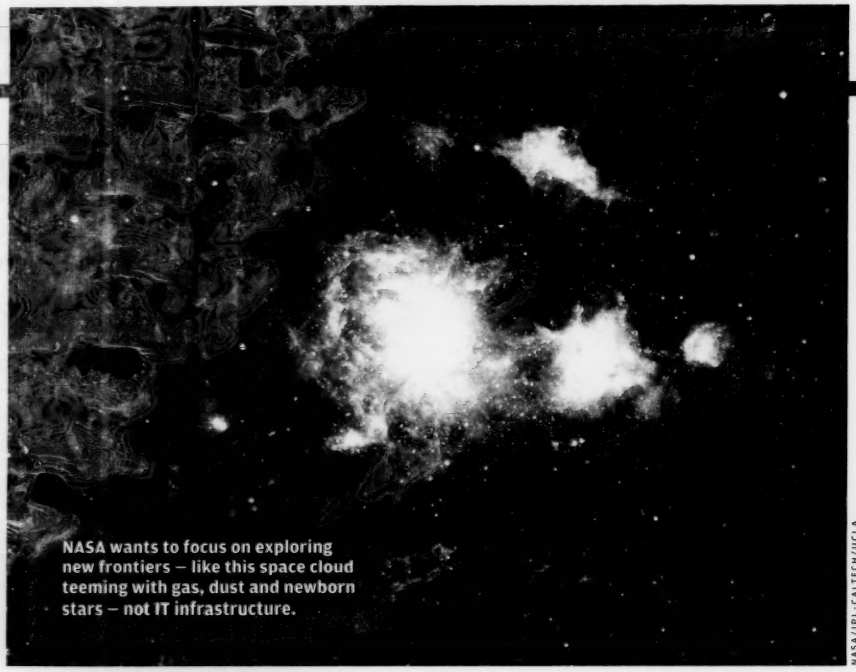

NASA wants to focus on exploring new frontiers – like this space cloud teeming with gas, dust and newborn stars – not IT infrastructure.

NASA/JPL-CALTECH/UCLA

DATA CENTERS

NASA Wants Its Data Up in the Clouds

NASA IS backing open-source cloud computing with a single goal in mind: to stick to space exploration and stop running data centers.

Chris Kemp, NASA's chief technology officer, said the agency's long-term plan is to move internal IT resources to external clouds over the next 10 to 20 years.

"I don't see why NASA needs to operate any [IT] infrastructure," he said at Gartner Inc.'s Symposium/ITxpo in Orlando last month. "We can build space probes, we can build deep space networks, we can stay out on the frontiers where the American public wants us to be, and not spend over $1 billion a year on IT infrastructure."

But many cloud platforms are still proprietary, which makes switching from one cloud provider to another difficult.

Hoping to solve that problem, NASA developed its own cloud computing software, Nebula, and released it as open-source code. Cloud service provider Rackspace Hosting Inc. then incorporated the Nebula code into its own cloud management software. That led to OpenStack, which this summer emerged as an open-source cloud platform.

For NASA, Kemp said, the benefits of open source are clear: It expands the number of developers working on OpenStack code and enables NASA to help influence its development and standards. "This furthers our objective of having off-the-shelf products that meet our requirements," which include less custom development and fewer proprietary systems, Kemp said.

– *Patrick Thibodeau*

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DESKTOP SYSTEMS

Microsoft May Face Resistance To Windows 8

Enterprises in the midst of migrating to Windows 7 are unlikely to repeat that same work in just two years with Windows 8, an analyst said last month.

"[Businesses] would certainly like to upgrade only to every other edition," said Gartner Inc. analyst Michael Silver. "If Windows 8 comes out in two years, many [enterprises] will be very suspect about migrating to the next release."

Silver said companies tire of migrating to new versions of operating systems, largely because businesses have critical applications that may or may not run on a new edition.

"It will depend on whether Windows 8 includes major architectural changes, or if it's more of a polishing release," Silver said. "If it's the latter, it will be kind of hard to skip. But if it's a major release, Microsoft will have a hard time selling [Windows 8] to the enterprise. They saw that when [companies] skipped Vista and stayed with XP."

Silver offered those comments after the Dutch arm of Microsoft Corp. suggested that the follow-on to Windows 7 – dubbed "Windows 8" by most, if not by Microsoft – will ship in 2012.

Michael Cherry, an analyst at Directions on Microsoft, said Microsoft faces a challenge with Windows 8 because "Windows 7 is a good operating system. It is reliable and works well."

– GREGG KEIZER

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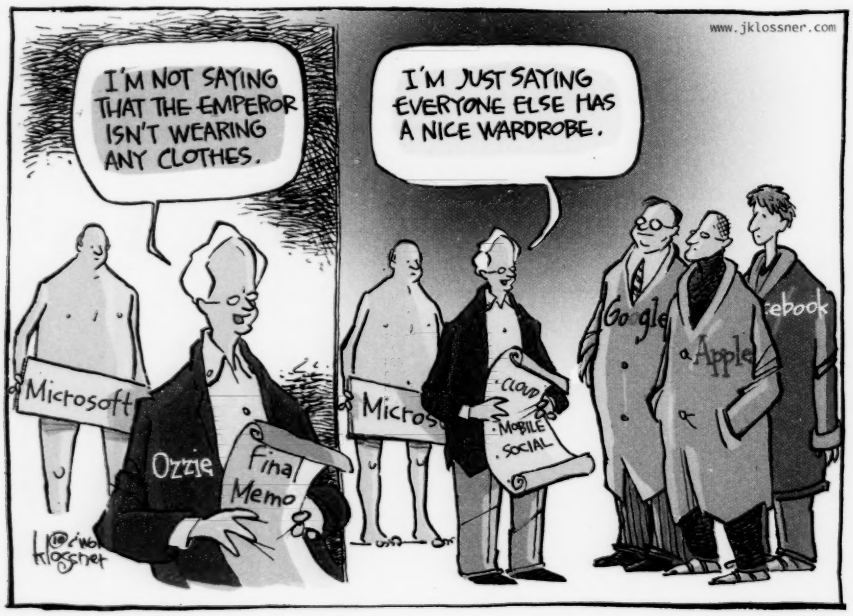
By John Klossner



WASHINGTON WATCH

FCC: Wireless Spectrum Shortage Looms

MOBILE DATA traffic in the U.S. will be 35 times higher in 2014 than it was in 2009, leading to a massive wireless spectrum shortage if the government fails to make more available, the Federal Communications Commission said in a paper released last month.

About 42% of U.S. mobile customers now own a smartphone, up from 16% three years ago, and between the first quarter of 2009 and the second quarter of 2010, data use per mobile line grew by 450%, the paper said.

The FCC expects smartphone use — and a corresponding increase in mobile data use — to continue to skyrocket, FCC Chairman Julius Genachowski said.

"If we don't act to update our spectrum policies for the 21st century, we're going to run into a wall — a spectrum crunch — that will stifle American innovation and economic growth and cost us the opportunity to lead the world in mobile communications," he warned.

In a national broadband plan released in March, the FCC called for 300 MHz of spectrum to be made available for mobile broadband uses in the next five years, and an additional 200 MHz in the subsequent five years.

Much of that spectrum would come from bands now controlled by the FCC or other government agencies, but 120 MHz would come from spectrum now owned but unused by U.S. television stations. Under the broadband plan, the stations would give back unused spectrum in exchange for part of the profits when the spectrum is sold at auction.

The FCC would need congressional approval to hold these so-called incentive auctions.

The National Association of Broadcasters was cool to the proposal that TV stations give up spectrum. NAB Executive Vice President Dennis Wharton said the trade group looks forward to working with the FCC and Congress to ensure that "spectrum deployment matches actual spectrum demand" and doesn't harm the U.S. broadcasting system.

– Grant Gross, IDG News Service

Micro Burst

In a survey of white-collar workers,

62%

admitted that the quality of their work suffers because of information overload.

MOBILE COMPUTING

Meet the CIO Who Bought 4,500 iPads

Medtronic Inc., which makes medical devices, may be one of the earliest and biggest corporate buyers of Apple Inc.'s iPad tablet. CIO Michael Hedges has purchased 4,500 iPads for his company, which employs 40,000 people.

The iPad was released on April 3, a Saturday, and Hedges quickly arranged to buy 10 iPads to ship to a trade show in Germany the following Wednesday.

Normally, Medtronic has large and very expensive displays at its booth, but in this case it loaded up the iPads with product information and then put them on display.

The iPad wasn't being sold yet in Europe, and the devices were an immediate hit, Hedges recalled at a Gartner Inc. event last month.

"It was such a huge success, because people came to our booth not to look at the Medtronic product but to look at the iPad," he said. "I didn't care – I just wanted them at the booth."

But Hedges bought many more iPads because they offer instant access to data and video, a particularly important attribute when showing product information to customers. Hedges added that the iPad's instant-on capability was a key feature for the business.

– PATRICK THIBODEAU

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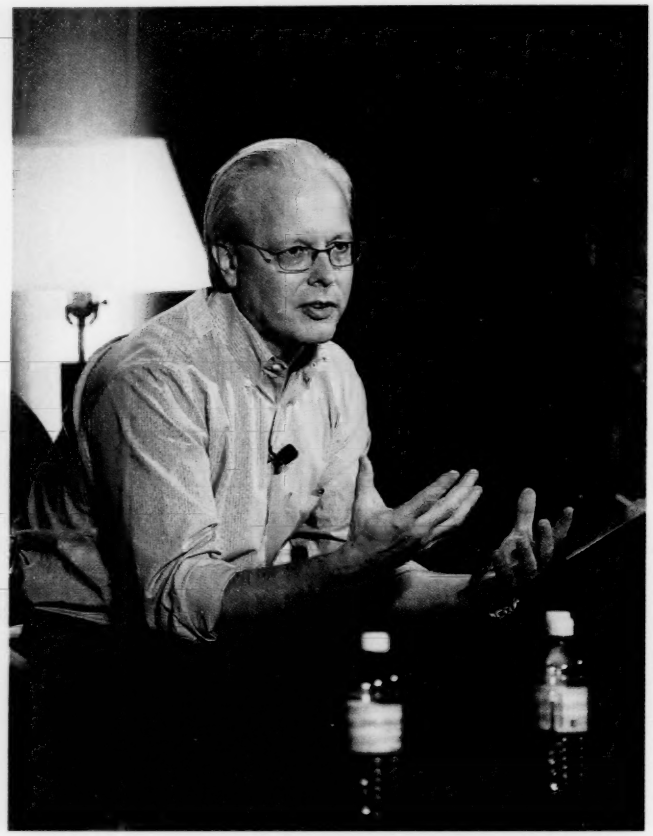

Ozzie to Microsoft: Simplify, Simplify ...

The chief software architect's 'doomsday-ish' clarion call implores Microsoft to further embrace cloud computing or face irrelevancy in an industry it has long dominated. By Gregg Keizer

DEPARTING MICROSOFT CORP. executive Ray Ozzie is leaving behind a new five-year plan that exhorts the company to push further into the cloud — or perish.

The so-called Dawn of a New Day memorandum written by Ozzie, who succeeded Bill Gates as Microsoft's chief software architect in 2006, urges the company to imagine a world where the PC is replaced by a slew of simple, low-cost devices that are constantly connected to the Internet and through that to cloud-based services.

The memo was posted on Ozzie's personal blog site shortly after Microsoft's Oct. 18 announcement that the creator of Lotus Notes planned to retire soon.

> **Complexity kills.** Complexity sucks the life out of users, developers and IT. Complexity makes products difficult to plan, build, test and use.
>
> **RAY OZZIE,** (LEFT) CHIEF SOFTWARE ARCHITECT, MICROSOFT CORP.

Wes Miller, an analyst at Directions on Microsoft and a former Microsoft product manager, noted that Ozzie's "doomsday-ish" missive "rarely mentions the words *PC* or *Windows*. The words that are most prominent are *devices* and *services*. That shows that Ozzie believes the future will revolve around connected devices and continuous services."

The communiqué is in many ways reminiscent of one Ozzie wrote in 2005 warning officials that the company had to quickly jump into the cloud.

"Ray has become synonymous with connected collaboration and the cloud," Miller said, noting that Ozzie oversaw development of the Azure cloud platform that Microsoft released earlier this year. "He's fought the valiant fight at Microsoft, but he's saying the company needs to continue investing in the cloud."

While Ozzie acknowledged the success that some of Microsoft's rivals have had in moving toward his worldview, he didn't name names. "Our early and clear vision notwithstanding, their execution has surpassed our own in mobile experiences, in the seamless fusion of hardware & software & services, and in social networking & myriad new forms of Internet-centric social interaction," Ozzie wrote.

Ozzie didn't have to mention Apple, Google or Facebook to get his message across to Microsoft, said Miller. "They know who he's talking about."

The memo urged Microsoft to stress simplicity over complexity and essentially said that the lucrative 35-year-old Windows franchise and its surrounding ecosystem are examples of the latter.

"Complexity kills," Ozzie said. "Complexity sucks the life out of users, developers and IT. Complexity makes products difficult to plan, build, test and use. Complexity introduces security challenges. Complexity causes administrator frustration."

It's unlikely that Ozzie's message came as a surprise to Microsoft's management team. "This may be the last chance for Ray Ozzie to make his thoughts known, but I think he's said this internally for a long time," said Miller.

But moving from a PC-centric world into the cloud won't be easy for a company the size of Microsoft.

"My frustration is that it's a big ship, and the velocity with which the boat is going will make it hard," Miller said. "You're talking about competing with companies that are, if not out-innovating Microsoft, then outpacing them." ◆

Nancy Gohring *of the IDG News Service contributed to this story.*

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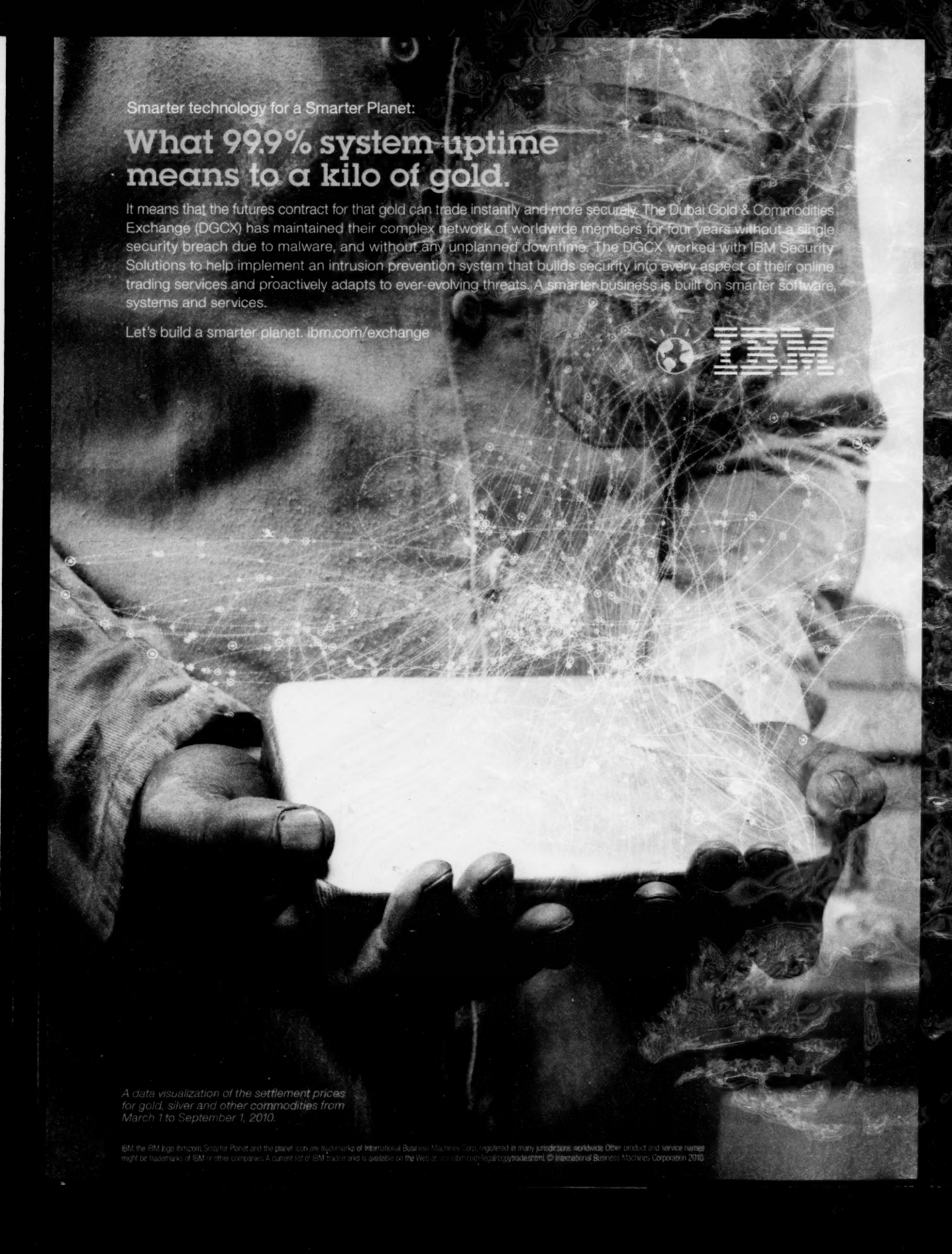
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New IT User Group Targets 'Super Vendors'

The Open Data Center Alliance, which claims to collectively spend billions on IT, hopes to wield a big stick in combating vendor lock-in and tech consolidation. By Patrick Thibodeau

WHEN THE OPEN DATA CENTER ALLIANCE was introduced late last month, its leaders claimed that the initial 70-plus members represented "over $50 billion in collective IT spending." Their message to IT vendors was unmistakable.

Andrew Feig, global head of the technology advisory group at alliance member UBS, said the new association aims to help its members retain "the ability to really run our business the way we want, versus being told how to run it [by vendors]."

Thus the consortium will use its combined clout to, among other things, persuade technology companies to slow or halt several trends, including the move toward vendor lock-in in the cloud, the increase in the number of proprietary and highly integrated technology stacks, and the continuation of IT industry consolidation — which alliance members cite as a key cause of the other problems they want to combat.

The worldwide alliance's membership includes major companies in a variety of industries that aren't focused on any one technology, including automaker BMW; financial services firms UBS, Deutsche Bank and JPMorgan Chase; hospitality company Marriott International; and energy supplier Shell Oil.

Jonathan Eunice, an analyst at Illuminata Inc., noted that the formation of the alliance runs counter to the trend of user groups shrinking in size and influence and becoming tightly integrated with specific vendors. "We really lack powerful user organizations in this industry," he said.

The alliance doesn't plan to publish specifications or standards, but it will create road maps and use cases that look at broad corporate IT needs, such as cross-platform management, interoperability and the ability to move infrastructure and applications from one cloud platform to another.

Then the group will use its hoped-for clout to urge tech vendors to plan products with those needs in mind.

Feig said many of the problems faced by large users can be traced to the persistent industry consolidation that is creating what Gartner Inc. calls "super vendors."

"Consolidation is continuing at a rapid pace," he said. "Start-ups get bought early on in their life cycle and never get to become big competitors to any of these guys."

Feig warned that without adequate recourse, companies that become excessively reliant on integrated products made by the big vendors will become less likely to adopt innovative new technologies.

Martin Wheeler, chief strategy officer at IT infrastructure services provider Terremark Worldwide Inc., and chairman and secretary of the alliance, added, "We've got to start having an organized voice so all these tremendous technological advances can be organized in a meaningful way."

Alliance President Curt Aubley, who is vice president of cybersecurity and next-generation innovations at Lockheed Martin Information Systems and Global Services, said he sees "amazing capabilities" developing on the Web. However, he added, if a developer "needs to move applications that they develop on one cloud platform to another cloud platform, they are in essence rewriting that application."

Vendors encourage feedback and want to be responsive to customer demands, said Aubley. The consortium will provide that feedback "in a more unified fashion," he explained.

Eunice said the creation of the alliance was likely encouraged in part by social media, which has led to more collaboration, openness and new attitudes about cooperation between vendors and their customers. ◆

OPEN DATA CENTER ALLIANCE

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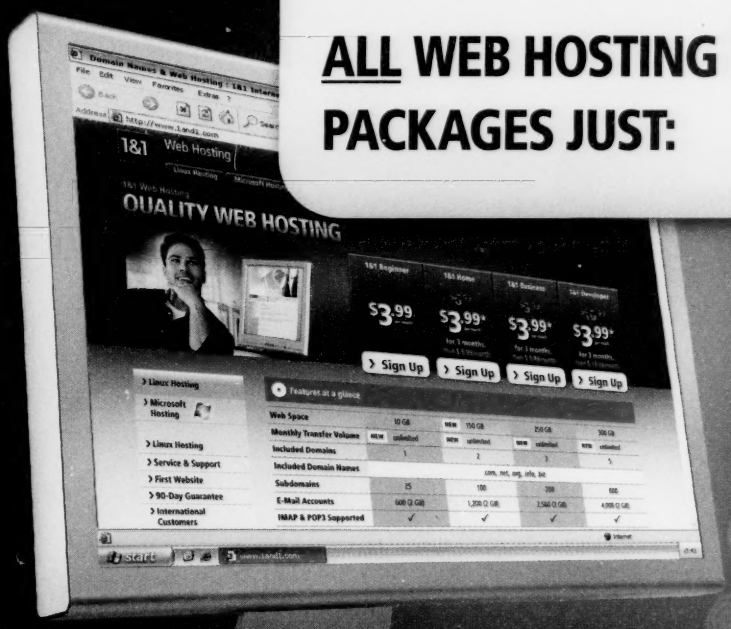

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THE Grill

Joe AbiDaoud

This mining company CIO must engineer change in a culture that resists it.

Role model: Kumud Kalia, CIO at Direct Energy. He is one of the best CIOs in the industry and helped me work into my first division CIO job.

Favorite pastime: I have two children under 2, so it's spending as much time as I can with them. I collect wine, and I like good cigars.

Favorite vice: I do love to eat. I love eating out at different restaurants quite a bit.

Recommended books: *Good to Great: Why Some Companies Make the Leap ... and Others Don't*, by Jim Collins. Also *Rework*, by Jason Fried and David Heinemeier Hansson, founders of 37signals LLC. Anyone going into the workforce should read that book.

JOE ABIDAOUD, *CIO at Toronto-based metals mining company HudBay Minerals Inc., supports more than 1,400 employees, including 1,200 miners in Flin Flon, a remote outpost in Manitoba where copper and zinc ore are extracted from a mine over a mile underground. Since starting in February, he has overseen the launch of a $20 million ERP project, but he has also been looking for "low-hanging fruit" — projects with a quick payback.* **AbiDaoud** *talked about what it's like to support IT operations in far-flung locations.*

What's the most challenging aspect of delivering IT services to a mining business? The operations happen in very remote areas of the world, so we support IT in a decentralized model. We provide regional support at the site of operation and have some centralized IT functions around shared services and IT governance. For the most part, we try to provide end-user support locally. Logistically, that's easier.

Continued on page 14

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Finalist: Shop Direct Group submitted with Speed-Trap
Finalist: The Bank of East Asia, Limited

Excellence in BI and Analytics

Winner: Cabela's Inc. submitted with Informatica Corporation

For a multi-channel data warehouse initiative and creation of an analytical information framework that has improved advertising effectiveness, inventory and margin strategies.

Finalist: Station Casinos submitted with IBM
Finalist: VIVO, S/A

Government and Non-Profit

Winner: Defense Logistics Agency (DLA) and United States Transportation Command (USTRANSCOM)

For excellence in strategic reuse of existing architecture across government agencies to create a scalable system that enables faster development of data applications.

Finalist: Centers for Medicare & Medicaid Services
Finalist: Land Transport Authority of Singapore submitted with Wipro Technologies

Industry Innovation

Winner: Vonage

For the speed and difficulty of building, in less than one year, a data warehouse with advanced analytics that collects and processes billions of registration records/day.

Finalist: Banco Bradesco
Finalist: Discover Financial Services

Integrated View of the Business

Winner: GE Healthcare

For the scope, process and results involved in the successful integration of data from different systems at more than 400 legal entities around the world, into an enterprise performance management system.

Finalist: American Airlines
Finalist: Siam Commercial Bank PCL

Continued from page 12

The mining industry is closely tied to the economy. When production ramps down, IT is a cost center that needs to be ramped down accordingly. We have to be able to react quickly. We are trying to create some variability in the IT services we provide, so we're looking at servicing some things through external parties. Database support has been outsourced. We're also looking at some infrastructure support. Our IT staff is pretty lean. [HudBay's IT group consists of 12 full-time staffers and seven contract workers.]

> **Not only can we provide services,** but we can anticipate the business needs and come to the table with things that add value.

What are your key IT initiatives for the coming year? Our ERP project is our No. 1 priority. No. 2 is building out another mine we have in the Flin Flon area, our largest to date. Our No. 3 priority is enhancements to the ERP system, which is expected to go into production in April 2011. The fourth thing is to digitize the exploration and development division's geological data.

What was the business case for the new ERP system? Management realized they couldn't scale. If we went out and bought another mine, we could not integrate that operation onto the platform that exists. If we put a mine in Arizona or Guatemala, we wouldn't have best-in-class systems and business processes for it. Our current business processes are very much custom-tailored to how people were doing things in Flin Flon. They are not scalable. They're very manual.

How does the remoteness of Flin Flon affect your IT architecture? We have mini data centers at these sites for performance reasons. However, I am not sure if we're going to stay with this model. Our new ERP system will be a shared service and will be hosted in our primary location.

Is it a challenge to redefine business processes for a new ERP system in a culture that isn't used to change? You've got people who enjoy doing things the way they have always done them for 25 or 30 years. So to come along and say, "Here's something new and something you can do differently," there's a huge amount of resistance to that.

We're talking about that right now with our ERP implementation. There has not been a major software implementation in this company since the early '90s. For us to introduce this new ERP system with new functionality, new ways of doing things and changing the business processes, they're finding that very difficult to cope with.

How are you addressing that resistance? The conversation [needs to be] around change management and how you get people to identify with the project.

If people can't identify with it, it has no relevance to their job. In fact, the guy who is driving a pickup truck [at a mine site] may not see a significant impact in terms of his job. But in terms of scheduling that person's job and scheduling repairs for that truck and ordering parts — that all will be driven by business processes governed by the new ERP system. So we have someone who works with each of the department heads to come up with a way of explaining how the change impacts people so they can identify with it.

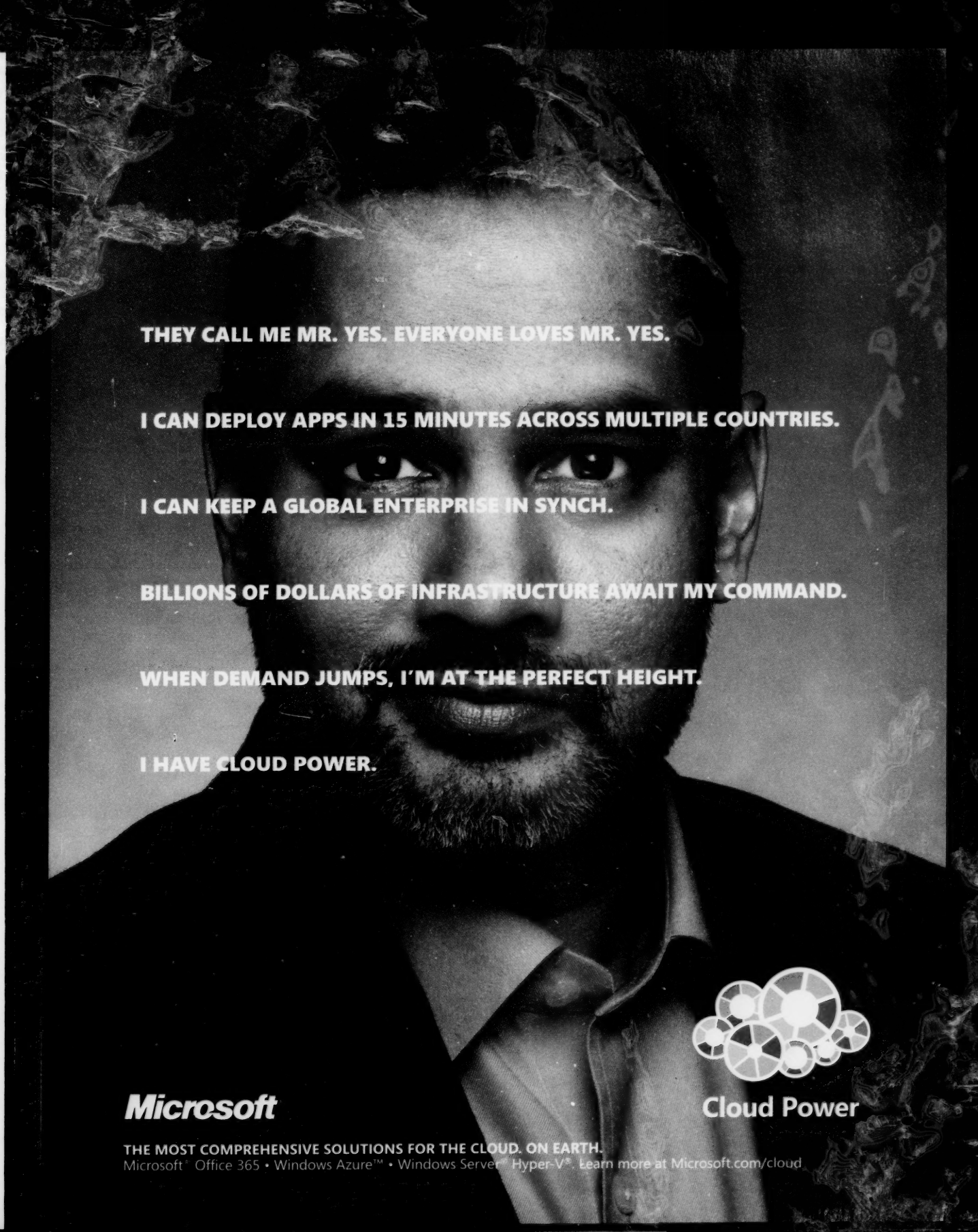
There are just 6,500 people in the greater Flin Flon area. How do you find qualified IT people in such a remote location? It is very difficult to recruit people, so we developed a program that takes people who are already in the organization and trains them to become IT professionals. These people could be working anywhere in mining operations.

What are your IT organization's biggest challenges? One is the perception of IT as an order-taker. Not only can we provide services, but we can anticipate the business needs and come to the table with things that add value.

For example, our exploration and development division is the lifeline of this organization. They're the ones that go out and find new mines or extend the ore body beyond what currently exists. We provide them with laptops and e-mail, and that's about it. They have kept all of their geological data on spreadsheets and paper. They could leave, and we would have no idea what they did or did not do. So we're looking at how to digitize all of that geological data and how to connect it so that it's more meaningful.

We have historical data that's been sitting in vaults for 40 or 50 years. If we digitize it and apply some new algorithms to it that didn't exist 40 or 50 years ago, they could probably find some more mines on land we explored and [thought was] exhausted. This is an area where IT can play a leadership role.

— *Interview by* **Robert L. Mitchell**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OPINION

S.J. VAUGHAN-NICHOLS

The iPad Stands Alone

I predicted that Linux-based tablets would quickly give the iPad a run for its money. I was wrong.

WHERE IS the iPad's competition?

By this time, I'd expected to see some real comers gunning for Apple's iPad tablet. Hasn't happened.

You want to talk about HP's just-released Slate 500? It has a starting list price of $799. An iPad can cost that much, but the price starts at $499, and people have demonstrated that they're willing to pay that much and more. Are people going to feel the same way about the Slate 500? Highly doubtful.

The Slate has an 8.9-in. screen, compared to iPad's 9.7 in., and it runs Windows 7. Now, tell me, how many Windows 7 apps are there for a pure touch-screen tablet? The iPad boasts over 5,000. And get this: For your 800 bucks, you get a Wi-Fi-only device. Makes you wonder whether HP's goal is to see whether it can ship a product that can die even faster than Microsoft's Kin did.

Some people would tell you that since Windows is under the hood, the Slate is going to get snapped up by business users who wouldn't touch an Apple product. Really? Thousands of people are already buying iPads for business use.

It's not just HP, though. HP just stands out for having the dumbest iPad-rival launch to date. Anyone paying attention knows that iPads are selling faster than hotcakes on a cold Vermont morning. So, where are the iPad's rivals?

The first problem was that everyone underestimated just how popular the iPad would be. There was a sense it was going to be big, but who knew that almost 7.5 million iPads would be sold in the device's first two quarters of existence? Suddenly, tablets went from being a niche market for companies like Fujitsu to being big, big business.

The result? Almost no one had their manufacturing ducks in a row. Even now you can see OEMs struggling with basic design issues. Will tablets with 7-in. displays sell? Maybe. Maybe not.

When it first became apparent that the iPad was going to turn the tablet PC from a niche product into a best-seller, I predicted that Linux-based tablets would quickly give the iPad a run for its money. I was wrong. I still think it will happen, just not as soon as I thought.

Linux-powered tablets like the Dell Streak, which is due to get upgraded to Android 2.2, are finally making their way into the marketplace, but there won't be a flood of them out by the holidays.

It turns out that while Android 2.0 and 2.2 make killer smartphone operating systems, they're not quite ready for tablets. The problem that many would-be Android tablet builders, such as Archos, Toshiba and ViewSonic, have encountered is that the current generations of Android don't do such a great job with a tablet's larger interface.

The other Linux contenders, such as MeeGo — the embedded Linux with the best chance to rival Android — won't be rolling out until 2011. The Google Chrome operating system, due out real soon now, is well, still due out real soon now.

Windows 7? Oh, I guess it could be a competitor, but historically Microsoft has always flopped with mobile phones and other embedded devices. The folks in Redmond have also done a lousy job of competing head-to-head with Apple in this arena. I can make my point with one word: Zune.

So, for the time being, or at least through the 2010 holiday season, the iPad rules. Sometime in 2011, we'll start seeing real competition, but not this year. I still think that the Android Linux models will be the first to give the iPad a real race. Unlike the other possible contenders, the Android Linux community already has a large group of application programmers ready and able to develop tablet apps, just as Apple does. But for now, it's still an iPad world. ◆

Steven J. Vaughan-Nichols has been writing about technology and the business of technology since CP/M-80 was cutting-edge and 300bit/sec. was a fast Internet connection — and we liked it! He can be reached at sjvn@vna1.com.

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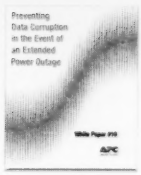

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THE Scary SIDE OF VIRTUALIZATION

COVER STORY

IT execs are starting to get spooked about the security risks of virtual servers. BY ROBERT L. MITCHELL

AT THE *Computerworld* Premier 100 IT Leaders conference in March, one CIO stood up to express his unease about the security of a virtual infrastructure that has subsumed more than half of his company's production servers. Two other IT executives chimed in with their own nagging worries.

None of the executives in that room wanted to admit on the record that they feel vulnerable, but Jai Chanani, senior director of technical services and architecture at Rent-A-Center Inc., feels their pain. "One of my biggest

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BEWARE THE All-powerful ADMIN

IN AN UNCHECKED, unmonitored virtual environment, administrators are all-powerful – and that's not a good thing, consultants and IT executives agree. "This gives server admins the keys to the kingdom, and most of the time they don't understand the security risks," says Vauda Jordan, senior security engineer for the Phoenix city government.

For example, administrators may create a virtual FTP server that compromises security. Or they may inadvertently use a virtual-machine migration tool to move a server onto different hardware for maintenance reasons, without realizing that the new host is on an untrusted network segment.

Failure to implement best practices, or to establish a clear separation of duties in virtual infrastructure, is an all-too-common problem, says Andrew Mulé, a senior security consultant at RSA. "Folks still today don't like to practice segregation of duties. They give the crown jewels to a small number of people," Mulé says. He recommends developing a strong change-management process that includes issuing change management tickets.

» **Rent-A-Center's KC Condit says a clear separation of duties is key in a virtualized environment.**

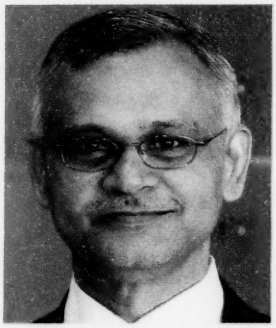
KC Condit, senior director of information security at Rent-A-Center, agrees. "In the virtual world, there is no inherent separation of duties, so you have to build that in," he says. Change management, configuration management and access control are vital to securing the virtual infrastructure.

Compliance is another concern. As director of systems engineering at the Council of Europe Development Bank, Jean-Louis Nguyen needs to monitor activity to ensure that the administrators of 140 virtual machines comply with regulations and management requirements. The bank tried using VMware's logging capabilities but needed a better way to consolidate the information. "Getting at those logs was nontrivial," he says. He ended up using a dedicated tool from HyTrust that provides a central log of all activity.

The bank also used HyTrust to set up a completely segregated virtual environment for the chief security officer, who can monitor the entire physical and virtual server infrastructure.

"The key is to assure your management that there's no administrator abuse," Nguyen says. "We needed to be certain that we're administering systems and not peeking into the data."

– ROBERT L. MITCHELL



» **Rent-A-Center's Jai Chanani doesn't use virtualization for ERP systems, databases or e-mail.**

fears is the ability to steal [virtual servers]," he says.

Chanani's team has about 200 virtual servers operating as file, print and, in some cases, application servers. But, for security reasons, his shop doesn't use virtualization for the company's ERP system, databases or e-mail.

Michael Israel, CIO at amusement park operator Six Flags Inc., voices a different concern. For him, the most unnerving scenario is a rogue administrator moving virtual servers from a secure network segment onto physical hosts in an unsecured segment, or creating new, undocumented, unlicensed and unpatched virtual servers. "The last thing I want is 25 servers out there that I don't know exist," he says.

John Kindervag, an analyst at Forrester Research Inc., says he's heard stories from clients who have had VMware's vCenter management console compromised, enabling the attacker to copy a virtual machine that can then be run to access data. "When you steal a VM, it's like you broke into the data center and stole a piece of hardware. It's potentially devastating," he says.

"We worked for many years with customers on best practices that make this a complete nonissue," says Venu Aravamudan, senior director of product marketing at VMware Inc. He says most users address such risks by following best practices such as creating an isolated network segment for managing the resources, and creating role-based access controls.

The migration onto virtual servers has saved businesses huge sums of money as a result of consolidation and improved efficiency, but as virtualization

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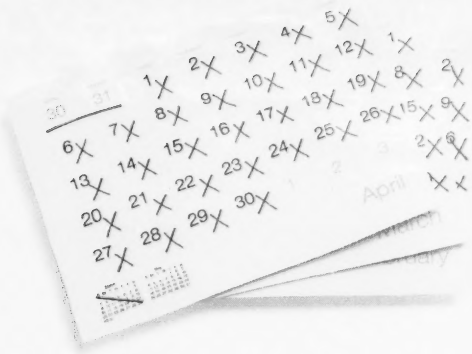
Customers wake up one day, realize that 50% of their business-critical apps reside on virtual infrastructure and say, 'Gee, is that secure?'

KRIS LOVEJOY, VICE PRESIDENT, IBM SECURITY SOLUTIONS



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gobbles up more and more production servers, some IT executives are getting indigestion. Has anything been overlooked? Could a catastrophic breach bring down critical applications — or perhaps an entire data center?

"Customers wake up one day, realize that 50% of their business-critical apps reside on virtual infrastructure and say, 'Gee, is that secure?' That's very common," says Kris Lovejoy, vice president of strategy at IBM Security Solutions, a security consultancy.

"There are some huge, well-known corporate names around the globe that you'd think would have this stuff pretty much beat. That couldn't be further from the truth," says Andrew Mulé, a senior security consultant in EMC Corp.'s RSA unit.

The problem isn't that a virtual infrastructure is difficult to secure per se, but that many companies still haven't adapted their best practices (if they have them) to the new environment.

HYPERVISOR: THE VIRTUAL ENFORCER?

Third-party vendors such as **Trend Micro Inc.** are offering add-on software to beef up the security of the hypervisor layer. But some experts worry that as the layer gets more crowded and complex, it becomes a bigger target for security attacks. For more on this topic, see our story at **http://tinyurl.com/hyper-secure**.

Virtual Headaches

Virtualization introduces technologies — including a new software layer, the hypervisor — that must be managed. Also new: virtual switching, which routes network traffic between virtual servers in ways that aren't always visible to tools designed to monitor traffic on the physical network.

Moreover, virtualization breaks down the traditional separation of duties within IT by allowing a single administrator to generate new virtual servers en masse at the push of a button, without approval from purchasing or input from the network, storage, business continuity or IT security groups (see "Beware the All-Powerful Admin," page 20).

Meanwhile, virtualization-aware security technologies and best practices are still evolving. The market has emerged so quickly that customers haven't been able to keep up from a best-practices standpoint, says Lovejoy. There's a lack of knowledge on the subject and a lack of skills in the field.

"The questions about security in a virtual environment are centered around lack of visibility, lack of control, and fear of the unknown," says Bill Trussell, managing director of security research at TheInfoPro, an IT market research firm in New York.

Could someone hijack a hypervisor within a business's virtual infrastructure and use it to compromise all of the virtual servers residing on top of it — as one CIO feared? Could an attacker breach one virtual server and use it as a platform to attack another virtual server, such as a payment-card processing application residing on the same hardware, without the administrator ever knowing about it?

Concerns about scary scenarios like those persist despite the fact that there have been no known attacks against virtual infrastructures, says Eric Baize, RSA's senior director for secure infrastructure.

When TheInfoPro surveyed 214 IT security professionals earlier this year, it found that one-third were "very or extremely" concerned about security in a virtualized environment.

Worries about an attack that could compromise a hypervisor rose after Joanna Rutkowska's demonstration of the "Blue Pill" hypervisor malware rootkit at a Black Hat conference in 2006.

Since then, however, the industry has moved forward with hardware technologies to ensure the integrity of hypervisors, such as Intel's Virtualization Technology for Directed I/O (known as VT-d). "Today, most of [Intel's] Core i5 and i7 processors have those technologies," and virtualization software providers have moved to support those features, says Rutkowska, founder and CEO of Invisible Things Lab, an IT security research firm.

Rutkowska herself doubts that anyone will actually use a Blue Pill-type rootkit to compromise virtual machines. "The bad guys don't really have any incentive to use such sophisticated rootkits," she says, especially since better-known rootkit technology from the '90s still works well for attacking traditional operating systems.

"People are wringing their hands over theoretical scenarios rather than ones that have been documented to be a problem," Trussell says.

But virtualization does involve risks if best practices aren't followed and adapted to a virtual infrastructure. For example, the hypervisor must be patched just like any other operating system, says KC Condit, senior director of information security at Rent-A-Center.

Security consultants say they've noticed a wide variety of security problems at customer sites.

Lovejoy is seeing malware and cross-site scripting issues that result from poorly constructed virtual machine images, for example. "Commonly, that image will contain malware or have vulnerabilities that can be exploited very easily," she says. "It used to happen once. Now these images are being deployed without end, creating massive headaches for people."

"We're seeing a lot of misconfigured hypervisors," adds RSA's Mulé. He says he often sees poor patch-management practices for virtual machines and the use of easily guessed or default usernames and passwords for virtual machine manager programs that have full access to the hypervisor. In addition, he says, "we sporadically see virtual machine management tools on the wrong side of the firewall."

Using default passwords when creating new virtual servers is very common, says Harold Moss, CTO of cloud security strategy at IBM Security Solutions,

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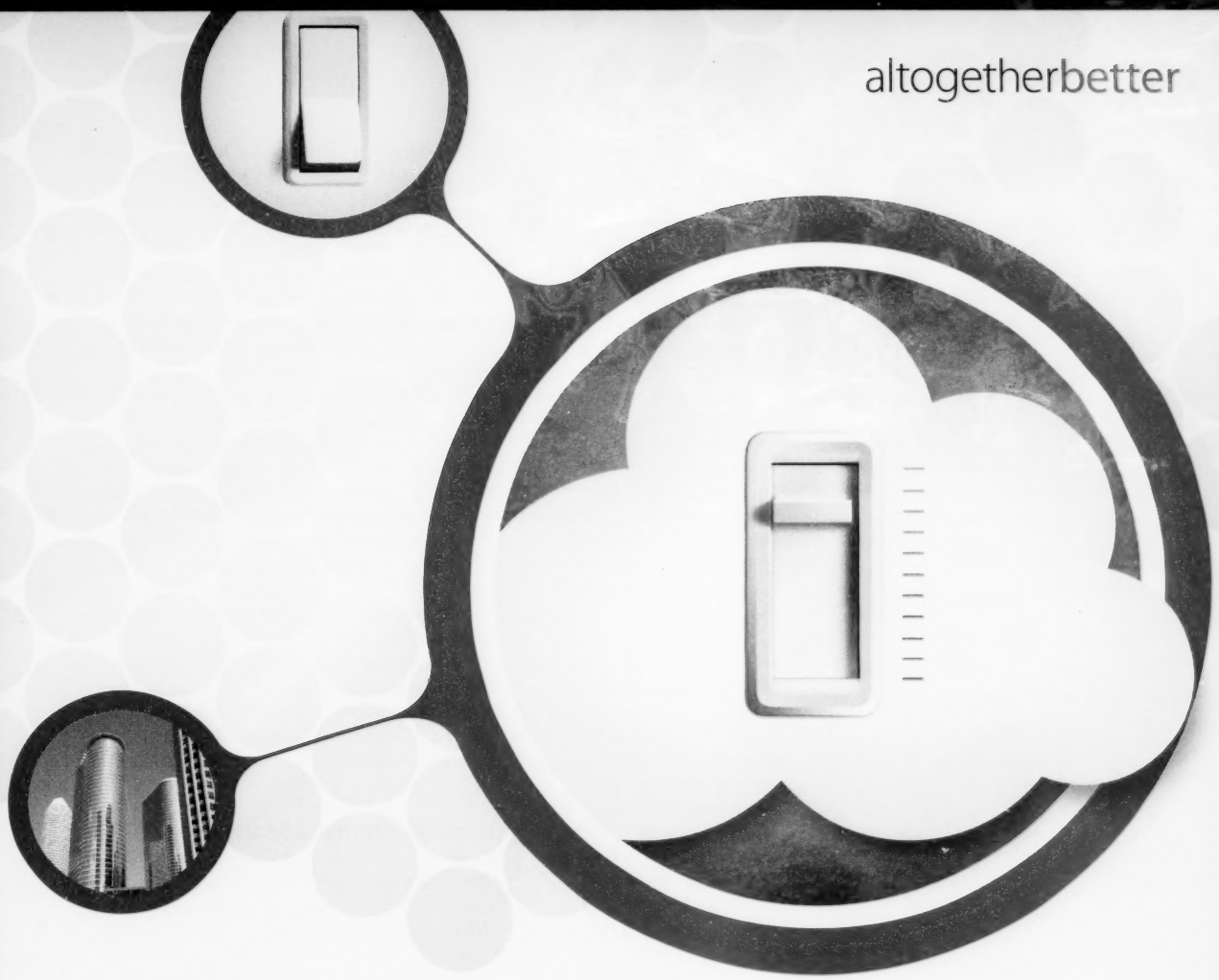

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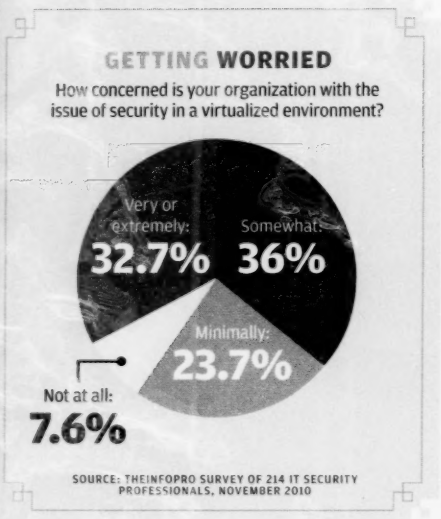
Continued from page 24

and people responsible for administering the new machines don't always change them either. Would-be thieves could dial into a machine, guess the password and have complete control, he explains.

In addition, because virtual machine images are data — program code stored on a hard disk drive somewhere — those files must be protected. "You don't want someone walking away with an entire server on a USB drive," says Vauda Jordan, senior security engineer for the Phoenix city government. She says the city uses a combination of physical security, network storage access controls and file integrity monitoring to protect virtual machine images.

The traffic flowing between virtual machines is another area of concern, since firewalls, intrusion-detection and -prevention systems, and other monitoring tools can't tell if the virtual machines are running on the same hardware.



"I've put packet sniffers on virtual servers, and nothing is going in and out of the physical network interface. So, how are those communications happening? And are they over secure channels?" asks Jordan. While the city has a significant investment in virtual infrastructure, Jordan won't even talk about the technology or its scope, citing security concerns.

With VMware's ESX Server and the other major virtualization platforms, the data that passes between virtual machines is unencrypted. Aravamudan says encryption is being "actively considered" at VMware, but he declined to say when it might be added to the company's products.

Systems like VMware's vShield and other third-party tools can create virtual firewalls that segment VMware, XenServer, Hyper-V and other virtual machines into different security zones, but not all organizations have implemented them. For example, the creation of secure zones hasn't been a big focus at Rent-A-Center. But as the virtual infrastructure scales up, that's becoming a necessity, says Condit.

Some existing firewall tools have visibility into virtual server traffic, but in other cases IT needs to add another set of virtualization-specific tools, and that adds to management complexity.

It's better to have a tool set that spans both the physical and virtual environments, says Neil MacDonald, an analyst at Gartner Inc. Until the traditional security tool vendors catch up, however, IT may need to bring in tools from lesser-known vendors like Altor Networks, Catbird Networks and HyTrust that have been tailored specifically to virtual machines.

More important, the core network architectures need to change to accommodate virtualization, says RSA's Mulé. "Networks that work correctly with physical servers don't necessarily work well with virtual machines. Security would be improved if proper routing and subnets and virtual LANs were implemented," he says. Most business continuity failures in virtualized settings can be attributed to network design flaws, he contends.

Matthew Nowell, senior systems engineer at Six Flags, uses virtual LANs to segregate virtual servers. "Depending on how we set up routing rules, they may or may not be able to talk to each other," he says.

But MacDonald cautions that "VLANs and router-based access controls alone are not sufficient for security separation." The research firm's guidelines call for the deployment of some sort of virtualization-aware firewall.

At the Phoenix city government, Jordan insists that systems administrators isolate each virtual server within its own security zone. "I had to fight with server admins who swear up and down that the hypervisor can do that. But I trust firewalls more than I trust hypervisors," she says.

Security From the Start

Securing a virtual infrastructure isn't about buying more tools, says RSA's Baize. "There's a lot available today in terms of controls for virtual infrastructure. What is lacking is the understanding of what the controls are for and when they should be applied," he says.

The best way to create a secure virtual infrastructure is to get security experts involved early. Gartner estimates that as many as 40% of IT shops don't seek IT security's input on a virtual deployment until after the system is already built and online.

The problem becomes more evident as mission-critical applications move into virtual machines. "When you start looking at virtualizing SharePoint or Exchange or ERP, you really are running into sensitive data. That forces the issue," MacDonald says.

By then, organizations are trying to bolt on security that should have been designed in from the beginning. That kind of after-the-fact redesign work can get expensive. "CIOs should make sure they have their top people in the loop when designing this type of architecture," MacDonald says.

It all comes down to policy, contends Condit. "If you don't have a strong security policy in place, a virtual infrastructure is going to show up those weaknesses much more quickly because things happen more rapidly," he says, referring to how quickly virtual servers can be created and then moved around between physical host servers.

CIOs are right to worry. Says Condit, "A certain healthy level of paranoia is always a good thing." ◆

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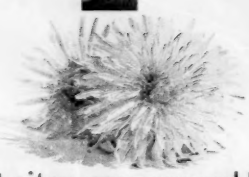
Solving SharePoint Sprawl



SharePoint sites can spread like weeds throughout a company, creating big legal risks. It's time to set some rules. By Mary Brandel

"**LIKE THE WILD WEST**" — that's how Dave Rettig, a senior manager in the strategy and technology alignment group at Raymond James Financial Inc., describes the firm's first implementation of SharePoint 2003. "It was a free-for-all. Everyone just sort of jumped in," Rettig says.

SharePoint is Microsoft Corp.'s software for collaboration, file sharing and Web publishing. "People saw it as just another file server," Rettig says, "and it ended up like someone's garage or attic."

So when SharePoint 2007 came out, a steering group that included Rettig decided to take some control. Instead of automatically upgrading, the group did so manually, porting just 10% of the earlier version's content to the new platform. It also required a "steward" and a backup person for each team's content site.

Security was another concern. Rettig categorized the financial

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> **People just put SharePoint out there, and it goes viral — suddenly you've got tens of thousands of sites.**
>
> GREG CLARK, CONSULTANT, C3 ASSOCIATES INC.

services firm's 14,000 to 15,000 SharePoint subsites into three groups — team sites, project sites and community sites — each with different levels of security controls. In addition, the steering group created a specific site to lock down any content containing personally identifiable information, with oversight by the data security staff. "No one can get into that area without security knowing about it," Rettig says. If personally identifiable information is found outside of that boundary, either through an automated scanner or human detection, it's immediately flagged, deleted or moved.

Moreover, forms that enter the SharePoint system from the retail sales force are archived in an optical storage system, with built-in rules for regulatory compliance and security enforcement.

In terms of centralized control, "we keep an eye on storage capacity, and we have tools to see how activity is going on the site," Rettig says. "[But] we don't really have total command and control, and I don't think there are a lot of companies out there who do."

That's for sure, agrees Doug Miles, director of market intelligence at AIIM, an association focused on enterprise content management. In a June survey of 624 organizations, AIIM found that 55% were establishing SharePoint policies for team sites, but other forms of governance were lacking. Just 22% said they provided staff with guidance on content type and classification, and only 15% had formal document-retention policies and legal-discovery procedures. Despite this, nearly a quarter (23%) had rolled out SharePoint to their entire staffs.

"It's kind of 'throw it against the wall and see what sticks,' in terms of what they'll use it for, which seems to fly in the face of a lot of good IT practice," Miles says. "I'm not saying I'm a control freak, but I do err on the side of decently written policies." Miles also urges companies to define which types of content can show up on SharePoint and which types should be reserved for other places, such as human resources and document management systems.

Microsoft included security, document management and other control-related capabilities in the newer versions of SharePoint (2007 and 2010), but the general intent behind SharePoint — free-form collaboration — runs counter to the notion of control. And nearly everyone who works with the system is reluctant to quash that freedom.

"The way to get control is to design policies upfront, like what the site is designed to be used for and what content is intended to be on it," says Larry Briggi, a managing director in the technology practice at FTI Consulting Inc. in New York. "But if you stifle it too much, users won't be able to do everything they're supposed to and the system is less useful."

Greg Clark, a consultant at C3 Associates Inc., a Calgary, Alberta-based consultancy specializing in enterprise content management,

SharePoint Pros and Cons

Top 10 Functions

The most popular applications of SharePoint:

1. Collaboration workspaces for teams
2. Document management
3. File sharing
4. Intranets (staff-facing Web sites)
5. Forums, blogs, wikis
6. Portals for company news
7. Portals to multiple content repositories
8. Enterprise search
9. Workflow/business process management
10. Staff profiles/directories

Base: 445 content managers who are using or plan to use SharePoint

Deployment Challenges

SharePoint implementers listed the following as their top deployment difficulties:

1. Managing process change
2. Took longer than expected
3. Resistance from users (additional interface to learn)
4. Technically more difficult than expected
5. Poor performance/inadequate infrastructure
6. Difficult to integrate with existing systems

Base: 362 content managers who are using or implementing SharePoint

SOURCE: AIIM SURVEY OF 624 ORGANIZATIONS, JUNE 2010

Advice From The Trenches

Anonymous quotes from managers who have deployed SharePoint:

"Focus on business requirements. Don't let IT drive the implementation."

"SharePoint is not an out-of-box implementation. With more and more implementations going on, good SharePoint consultants/experts are hard to come by."

"[You] need a governance plan first. It is an absolute must. The step cannot be skipped under any circumstances."

"Sort out governance. Sort out training. Sort out the information architecture. Sort out a basic taxonomy."

"Look for third-party tools to round it out. Find a good integrator."

"SharePoint will be the next new dumping ground for electronic documents."

LARRY BRIGGI, MANAGING DIRECTOR, FTI CONSULTING INC.

says SharePoint governance needs to include records managers and the legal department, not just IT. "People just put SharePoint out there, and it goes viral — suddenly you've got tens of thousands of sites," he warns. The trick is to manage SharePoint in a systematic way that's not so constrained that people don't want to use it.

E-discovery Concerns

One area that must be addressed is e-discovery of information for court cases. "SharePoint will be the next new dumping ground for electronic documents," following e-mail and shared directories, Briggi says. "That's a good thing from a usage and convenience perspective, but the downside is that it becomes a new [legal] discovery source. And that's a little more challenging."

Briggi points out that SharePoint systems can have millions of documents and hundreds of record custodians, and there's rarely a single go-to person who knows everything about the SharePoint environment.

Plus, the usual mechanism for finding documents in SharePoint — keyword searches — won't necessarily identify all the content relevant to a particular case. Part of this hinges on having the right keywords, and if indexing is not turned on for specific sites, the data in those areas will not be searched. To overcome such challenges, FTI Consulting designed an approach that searches the site by individual custodian, regardless of keywords, and then transfers that content outside of SharePoint, where it can be preserved in a legally acceptable way, Briggi says.

But companies need to consider the e-discovery implications of SharePoint at the outset of a project, before they're suddenly hit with a discovery request during litigation, observers say.

Jessica Carroll, managing director of IT at the United States Golf Association, says her organization is working to integrate SharePoint 2007 into its e-discovery system. The association purposefully selected an e-discovery system that could be customized to reach into SharePoint so the organization could place documents on legal hold and comply with document retention regulations.

The USGA's SharePoint implementation has two audiences: The organization's 350 internal employees, plus the external committee members and regional golf associations it works with. USGA SharePoint sites are used to publish reference material and forms, share ideas and host discussions between the outside groups and staff.

Companies also need to pay attention to government regulations, particularly those requiring retention periods for different types of documents. Miles says SharePoint 2007 provides the ability to move documents to a records repository. But according to the AIIM survey, only 40% of SharePoint users have instituted long-term archiving policies. "They're actually exposing themselves [to legal risks] because e-discovery and archiving haven't

caught up" to how people are using SharePoint, Miles says.

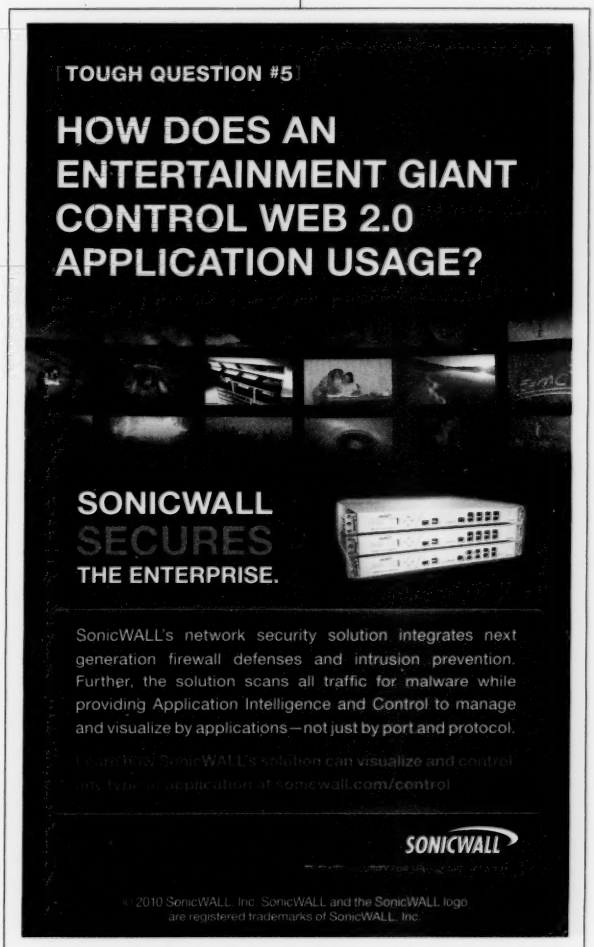
At the USGA, Carroll says that while SharePoint is used for document sharing and version control, materials that need to be retained or that have legal value will be kept in a conventional document management system.

Microsoft has added document management features to SharePoint, and although they fall short of the functionality in dedicated content management systems like Documentum, Open Text and FileNet, Miles says, SharePoint's tools are available at a much lower cost, making it possible to give document management capabilities to more users.

The AIIM survey found that some companies are using SharePoint as their very first content management system, while others are using it in tandem with a conventional document management system or as a front-end interface to an existing system.

"Everyone thinks [SharePoint] works out of the box as a document management system, but it doesn't," Miles says. For example, companies need to establish rules for maintaining consistency among corporate departments and ensure that the documents are managed according to the corporate records management plan throughout their life cycles, he says. "You don't want everyone creating different indexing schemes, for instance," Miles adds. "Those are issues that could come back and bite you later on."

For companies where individual departments create their own subsites, C3 Associates consultant Clark suggests setting up global guidelines for structural elements like folder taxonomies, metadata management and records retention.


TOUGH QUESTION #5
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Who's in Charge?

AIIM's survey found that most SharePoint projects are run by the IT department — sometimes with input from records managers and sometimes not. But in other cases, SharePoint is managed at the business unit level, leaving IT sidelined.

At the Georgia Aquarium, Vice President of IT Beach Clark set up a governance structure in which IT is the administrator for the entire SharePoint operation; it's responsible for setting up all subsites, and it responds to user requests for changes.

The aquarium has a public site for volunteers and an intranet for internal use. Departments tend to publish forms and other documents, whereas the corporate site publishes a newsletter and features a dashboard that reports on aquarium attendance and operational income. "We update those on a daily basis to help everyone maintain focus on achieving those two goals," Clark says.

Governance and user training were big factors when the Navy Reserve Forces Command implemented SharePoint last June. The command uses the system to share information and create standard workflows for processes such as requesting training or applying for a waiver of active duty. When rolling out SharePoint, the command developed a computer-based curriculum with a two-day module for a general overview and a five-day course for power users. "We wanted to make sure the audience was educated in the proper functionality of SharePoint to put some control on how it's used," says Capt. Matt Ragan.

The training covers security issues, such as the need to safeguard personal information, he says. The command also created a tool that asks users if documents they're uploading contain personally identifiable data and provides a link to information on dealing with such files. If a document does contain sensitive information, the user is required to protect it with a password, says Ragan.

In addition, documents with personally identifiable information are tagged so the command can find all such files and lock them down if necessary.

Security was also a "huge concern" for the USGA, particularly for internal sites that are shared by external and internal users, according to Carroll. The association addressed that issue by giving external users log-in access to the portal rather than access to the internal network. It did that with SharePoint's forms-based authentication tool, which provides the external users with log-in credentials separate from the internal Active Directory.

As use of SharePoint continues to grow, the issues of governance and control will evolve because people will continually come up with new ways to use it, according to Rettig. "We're still at it," he says. "We don't think we have it down, because humans change more than systems do." ◆

Brandel *is a* Computerworld *contributing writer. You can contact her at marybrandel@verizon.net.*

Time for Change?

A Computerworld poll shows that one out of three IT staffers is looking to switch employers. BY PATRICK THIBODEAU

COMPANIES HAVE CUT salaries and training, held back on bonuses and piled more work on employees in response to the economic downturn. These tactics may well be pushing many IT professionals to go job hunting, according to a recent *Computerworld* salary survey.

More than one-third (36%) of the 343 respondents to our recent poll said that they're looking to move to a new employer in the next six months. And 69% reported that they hadn't received a pay raise in the previous six months. The survey was conducted during the last two weeks in September.

For employers, the warning couldn't be more clear: As the economy improves, the most able IT workers might leave for something better.

Further results from the survey explain why employees want to bolt.

For example, only 54% of the respondents said their salary is higher today than it was in 2008, while 26% said there had been no change and one out of five said they were making less money than they were two years ago (see charts at right).

John Moore, a director of enterprise software development at a manufacturing firm, believes that IT budgets will free up early next year if the U.S. economy manages to avoid a double-dip recession, and then companies will begin catching up on neglected projects and hire new workers.

For companies that don't want to lose their technology staffers, Moore's advice is to ensure that IT employees are recognized as valued contributors.

"It's not about money — it's about employee appreciation," says Moore. "It's about open communication, and it's really about ensuring that your IT staff is invested in what you are doing."

Still an Employer's Market

But it won't be easy for job seekers, even if the economy picks up. The recession has changed how employers hire people. Job ads are much more specific and often include a list of exacting technical requirements, say IT professionals interviewed for this story.

"Employers are much more particular — it's very much an employer's market," says Bob Hibbits, a network engineer at a telecommunications company.

Hibbits says job seekers should expect to have a technical interview over the phone before being invited to a face-to-face meeting. "Employers are only going to look at very well-qualified people," he notes.

In years past, it might have been good enough to have six to eight of the 10 technical skills an employer might want, but now "there are enough people who don't have work that they can find someone who has them all," says Hibbits. He adds that he has also seen more employers initially hiring people on a contract basis before filling jobs permanently.

Steve Watson, a recruiter at executive search firm

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My strong advice to anybody in the business is make sure you are getting back to school to keep brushing up on your skills.

ROBERT NOVAK, SYSTEM ARCHITECT

Stanton Chase International in Dallas, says it's not surprising that more than one-third of IT workers responding to *Computerworld*'s salary survey are interested in leaving their current jobs, but he says that sentiment isn't entirely due to dissatisfaction with pay. "Some of that is lack of career advancement," he says. In the poll, 46% of the respondents said that they're less satisfied with their advancement opportunities now than they were six months ago, while only 14% said that they're more satisfied.

And, of course, the "doing more for less" drumbeat has made IT professionals more open to calls from recruiters, says Watson.

Several people interviewed for this article were reluctant to share their names, but their stories tended to corroborate the larger trends that showed up in the salary poll. One person interviewed offered a twist to the numbers.

An energy industry professional who asked for anonymity says younger people have greater job security because they cost less to employ. Meanwhile, the better-paid baby boomers are in danger of job loss.

"Among those at risk are those who are doing the same jobs that people are doing three to five years out of college," he says. IT professionals in the best position to survive a cut are those who have business analytical skills and can work with outsourcers, or those who can work on a system that's key to the company's mission, he says.

To some employers, the ideal job applicant is someone who is both a "brain surgeon and a Porsche mechanic," says an unemployed IT professional who didn't want his name used.

Education Pays Off

IF YOU CAN GET the right skills training, the salary premium can be impressive.

Consider the master of science in analytics degree program that computer science professor Michael Rappa started at North Carolina State University four years ago. The 10-month course features all-day classes and has a maximum enrollment of 40 students. The curriculum stresses teamwork and combines mathematics, computer science and business, with the goal of training people to help companies turn the vast amounts of data they collect into actionable information.

In the most recent class, 97% of the students had job offers within 90 days of graduation. Those jobs had an average starting salary and bonus of $94,000 – which is more than enough to cover the cost of the program.

The program's in-state tuition and fees are about $7,000; out-of-state students pay $21,000. About 90% of the people in the program are U.S. citizens or permanent residents because the types of financial assistance that foreign students typically seek aren't offered. Moreover, the program's emphasis on teamwork requires students to have strong English skills, says Rappa.

The students range in age from their early 20s to early 50s, he says.

So many companies recruit the program's students that employer demand exceeds the supply of graduates. "We had a number of employers come in and walk away empty-handed," says Rappa, who notes that he would like to expand the program.

– PATRICK THIBODEAU

Indeed, employers are looking for a "precision, laser-guided skill set," says Robert Novak, a system architect.

"My strong advice to anybody in the business is make sure you are getting back to school to keep brushing up on your skills," says Novak, adding that he makes an effort to do that.

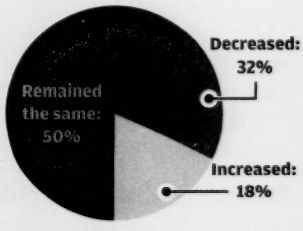
But wherever IT professionals look for new work, the pickings will be slim, at least for now. Only 37% of the respondents to *Computerworld*'s poll said their companies are currently hiring in their IT departments. ◆

FROZEN SALARIES

Have you received a pay raise in the past six months?

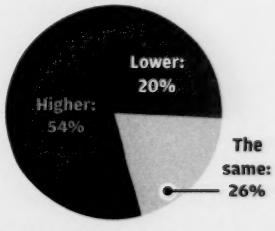
SATISFACTION STAGNATES

Compared with six months ago, has your satisfaction with your compensation . . .

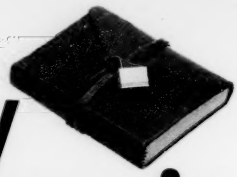


LOSING GROUND?

Please compare your current salary to the salary you earned in 2008. Is your current salary . . .



SOURCE: EXCLUSIVE *COMPUTERWORLD* SURVEY, SEPTEMBER 2010; 343 IT RESPONDENTS



Security Manager's Journal

MATHIAS THURMAN

Spying, or Something Innocent?

A log suggests that two executives logged into a tool they shouldn't mess with. Time to investigate.

I DON'T KNOW whether I should admit this, but one of my favorite activities as a security manager is incident response.

Sure, incidents can be a security manager's worst nightmare, putting you and your security program on the spot. But they are fairly rare at my company, so when we do have one, it is something of a break from my general routine of audits, compliance activity and meetings. They are usually challenging, and sometimes we catch a bad guy.

Our most recent event didn't uncover any bad guys, as it turns out, but we did discover a configuration error in our Microsoft DNS servers.

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Here's what happened: One of our engineers was using software called Remote Admin (Radmin) to troubleshoot one of the expensive, specialized measurement tools that my company designs and manufactures. While reviewing connection logs from the Radmin server software, he noticed some suspicious activity that had originated from the PCs of two of the most senior executives in the company. That was very strange, since our high-level executives don't normally log into the tools. Why would these executives have done that? I had to wonder. So I asked them. One took a look at the logs and said that at the time of the connection, he had been sleeping. The other executive said that when his machine was supposedly logging into one of our tools, he was high above the Atlantic on his way to Europe. So how could these machines, which were turned off or unattended, be responsible for the suspicious connections?

As it turned out, they weren't. In fact, the log-ins weren't done from two different PCs belonging to two executives but from one PC belonging to an engineer with a legitimate reason to log into the tool.

So how was it that a Domain Name System reverse lookup had fingered the wrong parties?

In our company, we use Dynamic Host Configuration Protocol, or DHCP, which assigns an IP address from a predefined network range. We have DHCP configured so that each IP address assignment expires after two weeks, after which the PC is assigned a different IP address the next time it comes on the network. What I hadn't realized was that our Windows environment keeps the cache information on all these IP address assignments rather than purging the old entries.

Caching Out

I couldn't understand why we would arrange things this way, so I asked our Windows server team, who told me that they had disabled automatic flushing of the DNS cache because it had caused problems. What sort of problems? I wanted to know. Uh, well, no one could remember exactly. In any event, this caching was why our logs had pointed to the two executives, since their PCs had been assigned those two IP addresses in the past.

We'll have to investigate what the reason was for disabling the flushing of the DNS cache; it might not even be a real problem anymore, and we'll certainly find a way around it if it is still a valid problem, so that we can re-enable the automatic flushing.

In the end, we didn't have any executives involved in industrial espionage. But even though this incident was a false positive, it was an interesting diversion. And it provided a good lesson on the importance of reviewing configuration baselines to ensure that DNS servers properly flush information. Of course, I also want to have historical information available to answer questions such as who was assigned a particular IP address at a given date and time. That can be critical information to have, and we'll want to retain it. ◆

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"Incident response can be an interesting diversion, but it's also a chance to uncover vulnerabilities.

Trouble Ticket

ALERT: A log shows that two high-level executives' PCs were used to log into a sensitive tool. That seems rather suspicious.

ACTION PLAN: Look into the incident, starting by asking the executives what they were doing at the time of the log-ins.

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Winckworth Sherwood, London, England

Best Practices in **Technology Innovation and Promise**

WINNER: *QUALCOMM*, San Diego, California

Finalists: *American Society of Health-System Pharmacists*, Bethesda, Maryland
Garden City Co-op, Inc., Garden City, Kansas
Oroville Hospital, Oroville, California
TechniGraphics, Inc., Wooster, North Dakota

Best Practices in **Virtualization and Cloud Computing**

WINNER: *SPRINT*, Overland Park, Kansas

Finalists: *Almaviva Tele Sistemi Ferroviari (TSF)*, Rome, Italy
Applied Materials, Austin, Texas
Cartika IT Solutions Inc., Toronto, Canada
Gilbarco Veeder-Root, Greensboro, North Carolina

The SNW "Best Practices" Award recipients were honored on Wednesday, October 13th at the SNW Fall 2010 conference in Dallas, Texas.

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Submit your case study for SNW's Spring 2011 Best Practices Awards Program! Please visit www.snwusa.com and click on the Awards tab for more information. Nominations will open in mid-November.

OPINION

BART PERKINS

Project Management: No Horsing Around

IT organizations are expected to complete projects on time, on budget and with high quality – but often don't.

HOW WOULD you like to be responsible for an IT project in support of a world-famous sporting event? Much of the hardware and software will be chosen, supplied and installed by vendors that are also event sponsors (selected to meet long-term site needs, even when in conflict with the event requirements). The site covers 600 acres, and though major upgrades to the infrastructure are needed, you can't get access to the site until 19 days before going live. Oh, and the whole world will be watching. Want to sign up?

These challenges, and others, faced IT support for the Alltech FEI World Equestrian Games (WEG), the World Cup for horses. The 2010 WEG was held at the Kentucky Horse Park in Lexington, Ky. As the first WEG held outside Europe, it had to be flawless. But the IT challenges were monumental:

No playbook. The WEG has no formal procedures or process to share lessons learned from past events. (The Olympics, in contrast, have standardized IT operating procedures.) Unlike European WEGs, the 2010 games were held in a single location, necessitating versatile reuse of event sites, which added logistical complexity.

Limited infrastructure. Although power, cell coverage and Internet access were upgraded prior to the WEG, existing systems were still insufficient for an event of this size. WEG IT expanded the Horse Park's network to include most of the park. It was partitioned to support credit card transactions, large-photo transmission and broadcast television without interfering with the ground crew and security radio-frequency networks. Seventy generators provided additional power during the games.

Decentralized organization. The WEG relied heavily on volunteers, contractors, vendors and sponsors. IT systems facilitated information-sharing across these semi-autonomous silos.

Unique requirements. Jumping events were held in one ring, requiring reconfiguration of physical jumps between events. Corresponding power and fiber-optic cables had to be physically relocated; new ditches were dug before each event, and cables laid and buried. For the first time, GPS devices were attached to saddles to track horses on the 100-mile cross-country endurance ride. If a horse stopped moving, help could be dispatched quickly. In addition, judges and spectators could monitor the progress and relative standings of the horses, even while they were out of sight.

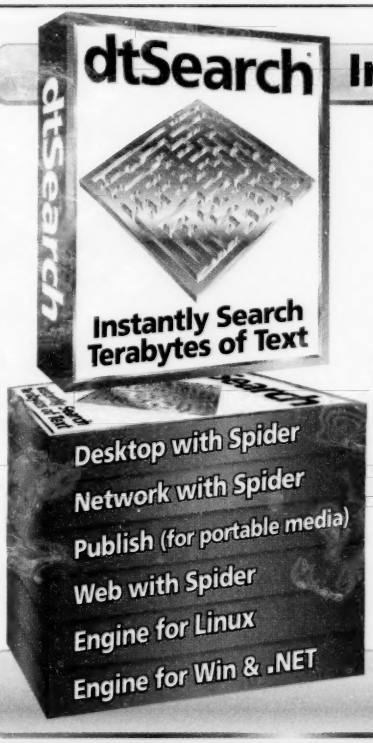
Scheduling and tracking 5,000 volunteers was complicated because many worked only two or three days. All systems had to be highly intuitive, requiring virtually no training.

High security. Many owners, riders and visitors were royalty or wealthy people from Europe and the Middle East. Over 40 federal, state and local agencies worked together in a joint operations command center. WEG IT systems had to interface with command center protocols.

IT organizations are expected to complete projects on time, on budget and with high quality. But many fail to meet these expectations. IT support for the 2010 WEG was highly successful, demonstrating that IT projects can succeed even under extremely difficult circumstances.

Such projects can inspire IT organizations everywhere. So add a horse photo to your desktop, as a symbol of creativity, versatility, grace under pressure and teamwork. Let the can-do spirit of the World Equestrian Games inspire you and your organization to achieve the nearly impossible. ◆

Bart Perkins is managing partner at Louisville, Ky.-based Leverage Partners Inc., which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.



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Career Watch

Staffing Firm Foresees Salary Increases in 2011

Robert Half Technology has released its Salary Guide 2011. Drawing on an analysis of the thousands of job placements managed by the company's U.S. offices, the staffing firm predicts that IT professionals' salaries will increase by an average of 3.4% in 2011. A detailed report is available for download.

Here's the forecast for selected positions:

JOB TITLE	2010	2011	% CHANGE
CIO	$130,250 - $210,500	$134,500 - $217,000	3.2%
CTO	$111,750 - $174,250	$116,500 - $181,750	4.3%
CSO	$107,500 - $160,250	$110,750 - $165,750	3.5%
Vice president of IT	$116,500 - $169,000	$118,500 - $173,000	2.1%
IT manager	$85,750 - $124,250	$88,250 - $127,000	2.5%
Project manager	$75,000 - $111,500	$76,250 - $113,000	1.5%
Systems analyst	$65,250 - $92,250	$65,500 - $93,500	1%
ERP business analyst	$68,000 - $93,250	$71,250 - $98,250	5.1%
Lead application developer	$81,500 - $112,000	$85,000 - $117,500	4.7%
Database administrator	$72,750 - $107,000	$76,000 - $109,500	3.2%
Web developer	$57,500 - $88,000	$58,000 - $94,250	4.6%
Web designer	$50,250 - $76,500	$50,750 - $83,000	5.5%
Network manager	$76,750 - $105,250	$79,250 - $109,500	4.3%
Data security analyst	$80,250 - $109,750	$84,000 - $114,500	4.5%
Network security administrator	$77,750 - $106,500	$81,000 - $111,250	4.3%
Software engineer	$71,250 - $107,000	$73,500 - $112,000	4.1%
Systems administrator	$51,250 - $80,250	$53,250 - $83,000	3.6%
Help desk Tier 3	$44,750 - $57,500	$45,750 - $59,000	2.4%

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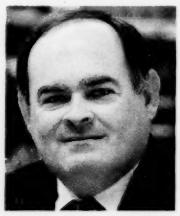
ASK A PREMIER 100 IT LEADER



Bradley P. Wright

The vice president for global communications technology at **Jacobs Engineering Group** *answers questions about communicating more clearly, dealing with a poorly performing peer, and the elements of career success.*

I'm one of many IT directors in my company. We've been talking a lot about the future direction of IT. We all chip in with thoughts and ideas at meetings, but I feel I don't get my points across well, and so what I have to say is usually ignored. (Sometimes someone else will say the same thing, only better, at a later meeting, and his ideas are adopted.) How can I become less tongue-tied? Verbal communication is foundational to success in leadership. Public-speaking workshops and practice can go a long way toward improving your ability to clearly and succinctly express your thoughts. But here's another idea that might get your thoughts acknowledged now, while you work on your verbal delivery skills: Before each discussion, invest a bit of time researching what other leaders and companies are doing in your areas of interest. Use your *Computerworld* resources! Find a couple of cases where results have been achieved by others using your approach or one similar. When you chip in, lead with your idea, and immediately follow with the examples and results you've discovered. Be prepared to lead your group in discussing how the idea may fit in your environment, if they seem interested. You've now made a compelling case that's hard to ignore. Furthermore, you've come to really contribute, and others will notice and follow suit.

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com**, and watch for this column each month.

My boss made a recent hire (I'm in network security), and he was very enthusiastic in announcing it. Having worked closely with the new guy, I'm not so enthusiastic. My boss doesn't seek our feedback on things like this, so how can I help him realize that he bought a lemon? Clearly, this situation is challenging on many levels, but it would be a mistake for you to work toward undermining a peer's credibility. Instead, I would suggest an approach that focuses on organizational success and individual improvement. First, in meetings and communication, help make it very clear what you, your organization and your customers need from your team (and your peer) to be successful.

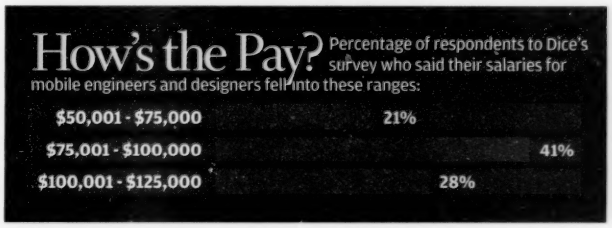
If you don't presently have a way to collect actionable input and feedback from customers, offer your boss your help in establishing a program. Second, identify areas where *as a team* you failed to meet expectations. It is important that you address failures only at a team level. As a team, create action plans to address those opportunities. Finally, take a look at how your team performs against those action plans, and observe any changes in customer feedback. Executed well, these steps and the visibility they create will either help your peer become a productive member of your team or highlight for your boss the need for further action.

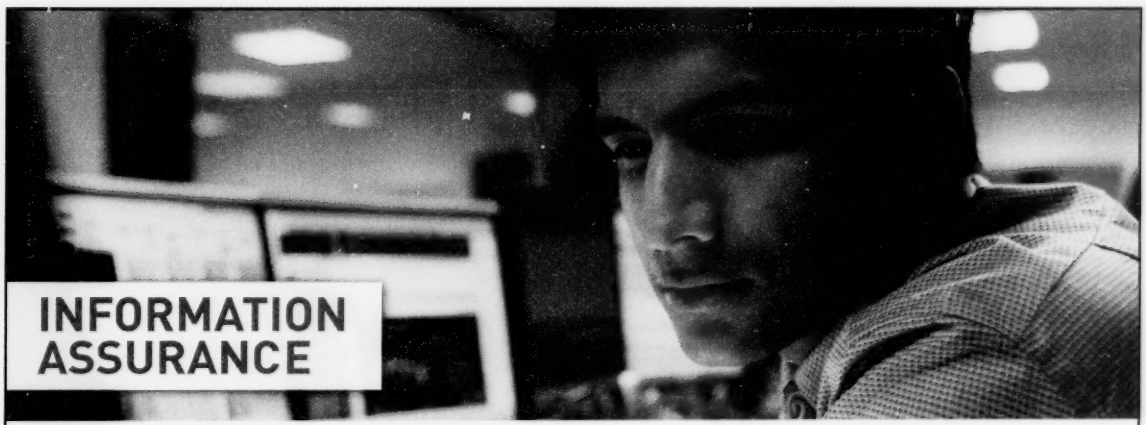
In your career, has experience, education or knowing the right people been most beneficial? It's not a question of either/or. All have been important for success. I would say ultimately that experience (results and impact) have been the most beneficial in terms of career advancement. But relevant experience, I've found, depends on leveraging my own knowledge and that of others through strong working relationships. By investing your own time and energy in studying industry and leadership trends, you make yourself relevant. By reaching out to others and leveraging their talents and experience, you amplify the impact of your contributions and create lasting professional connections. So while experience rules, the best experience is that of driving results through relationships.

CAREER CLUE

Mobile-Software Development

According to a survey by Dice.com, 57% of employers and recruiters who have filled mobile-related development positions in the past 12 months plan to expand such hiring in the next 12 months. They're looking for development professionals with experience in programming for mobile platforms such as Research In Motion's BlackBerry, Apple's iPhone and Google's Android. Of the 238 respondents to the online survey, more than one-fifth said they had hired substantially more mobile experts in the past year than they had a year earlier, and a similar percentage anticipated a substantial increase in hiring over the next 12 months. Another 37% said they expect to see a slight increase.


How's the Pay?
Percentage of respondents to Dice's survey who said their salaries for mobile engineers and designers fell into these ranges:
$50,001 - $75,000
21%
$75,001 - $100,000
41%
$100,001 - $125,000
28%



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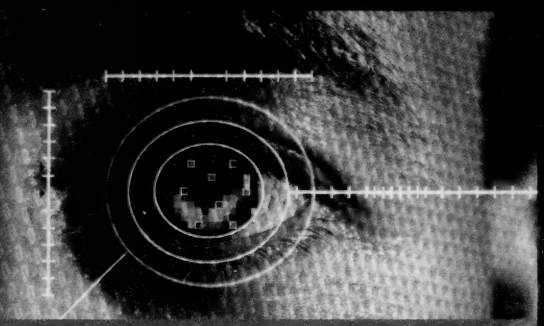

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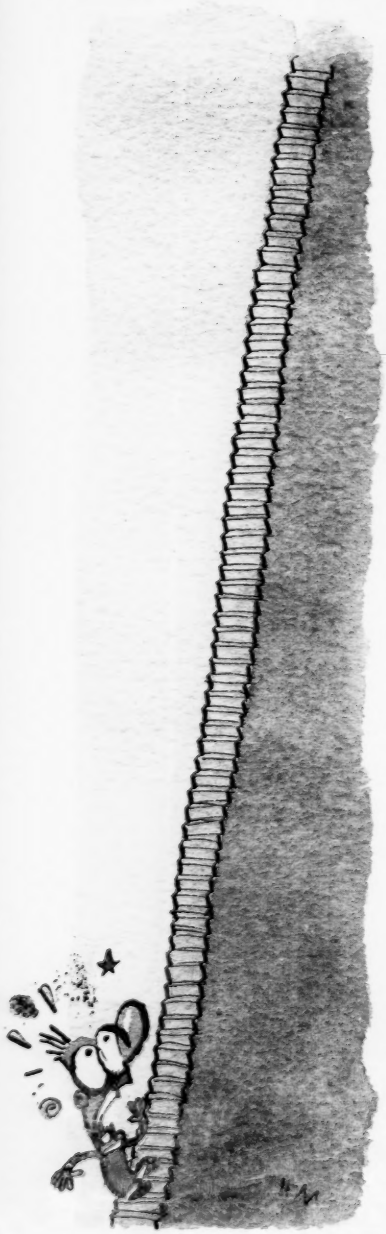

Getting to the Top — The Hard Way

IT VP pilot fish gets an early-morning call from a divisional president — and fish already has a pretty good idea what it's about. "One of our offices is located in a downtown Los Angeles skyscraper," says fish. "During a recent heat wave in Southern California, the entire building lost power in the middle of the night. When I woke up (in the Central time zone), I checked my e-mail and had several messages from the UPS systems that power was lost. At 8 a.m. (6 a.m. Pacific), I got a call on my cell phone from the president of that division. I answered, 'I hear your power is out.' He said that he had been notified of the problem by the landlord and wanted to make me aware. He then told me he was on his way to the office so he could be there when the power came back on. I told him to enjoy the 36-story hike up to the office. 'Oh, @#$%!,' he said. 'I didn't think about that.' It never occurred to him that a power outage would affect more than just the office space."

Oh, Right!

Consultant pilot fish is working on extending the logical data model for a big company's data warehouse. That appeared to be a trivial job — at least until fish actually took a good look at it. "You name it, every no-no about data modeling had been hit," fish says. "No documentation, hidden relationships, diagram unreadable, and so on. I had lunch with the hiring manager. Since I knew he was a recent hire and had nothing to do with the way the existing model was put together, I decided I could risk a rant. 'This model is showing signs of extreme organic growth,' I said, using consultant-speak for *This model is a heap of @#$%!* 'I know,' he replied calmly. 'Why do you think you're here?' At that point, all I could do was grin sheepishly."

When in Doubt, RTFM

Pilot fish tests a piece of financial analysis software and then writes the manual for it. Well, most of it, anyhow. "There was one area where I just didn't understand the concept," he says. "Try as I might, nothing. The concept was obscure and there was no time left, so the designer wrote that small section of the manual. Sometime later, I was answering support calls for the software, and someone called asking how this feature worked. I was at a complete loss. There was no way I could explain it, so I dug out the manual, found the section and read it to the user — word for word. The user immediately responded with, 'Oh, thank you very much! That was so clear. You were a big help!' I replied, 'Glad I could be here for you.' I still don't understand the concept, and I can't figure out how the user understood it so easily."

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COMPUTERWORLD

HEADQUARTERS
P.O. Box 9171
492 Old Connecticut Path
Framingham, MA 01701-9171
(508) 879-0700
Fax (508) 875-4394

President/CEO
Michael Friedenberg
(508) 935-4310

Executive Assistant to the President/CEO
Pamela Carlson
(508) 935-4274

Senior Vice President/ Group Publisher
Bob Melk
(415) 975-2685

Vice President/Marketing
Sue Yanovitch
(508) 935-4448

Senior Vice President/ Chief Content Officer
John Gallant
(508) 766-5426

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(508) 820-8102

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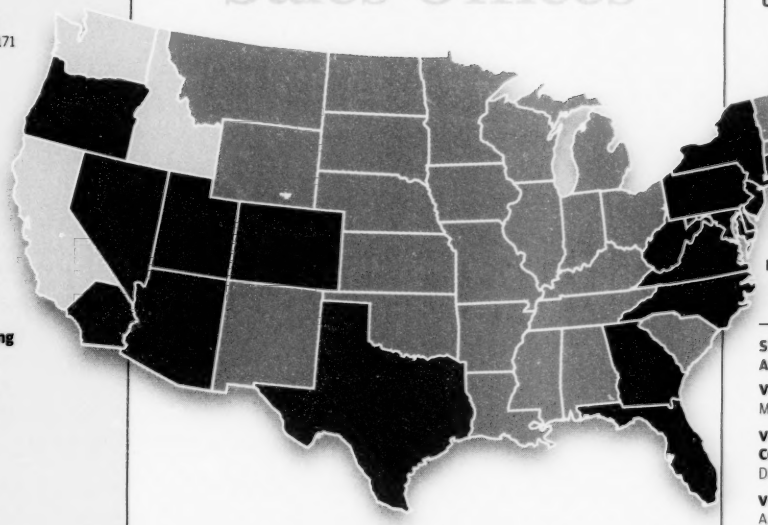

Vice President/Publisher John Amato
john_amato@computerworld.com (508) 820-8279

NORTHWESTERN STATES AND NORTHERN CALIFORNIA

Account Director, Integrated Sales
Neil Dhanowa (415) 978-3305

Sales Associate
Nida Thongnopneua (415) 978-3312

Mailing Address
501 Second Street, Suite 114,
San Francisco, CA 94107
Fax (415) 543-8010

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Account Director, Integrated Sales
Jeff Gallagher (508) 820-8133

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Mailing Address
P.O. Box 9171, 492 Old Connecticut Path, Framingham, MA 01701
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Mailing Address
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Danielle Thorne (508) 988-7969
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Online Sales Assistant
Joan Olson (508) 270-7112
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IT CAREERS

Publisher
John Amato (508) 820-8279
Fax (508) 270-3882

Regional Account Manager
Enku Gubaie (508) 766-5487

LIST RENTAL

Postal and E-mail
Rich Green (508) 370-0832
rgreen@idglist.com

Mailing Address
IDG List Services, P.O. Box 9151
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SUBSCRIPTIONS

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OPINION

SCOT FINNIE

Getting IT Set for Mobile

New *Computerworld* research suggests that IT shops are moving to address mobility issues.

"THIS BUSINESS will get out of control. It will get out of control, and we'll be lucky to live through it."

That's a quote from the movie *The Hunt for Red October*, but it's also a paraphrase of my July column, "The Rise of Consumer Tech." I was lamenting the lack of readiness at many IT shops to handle the explosion of consumer devices, apps and mobile platforms. And make no mistake, IT faces several challenges in the management and support of mobile. But I may have overestimated the cause for concern.

New *Computerworld* research suggests that IT shops are moving to address mobility issues — or that they're at least aware of the need to do so. Especially telling are these stats from *Computerworld*'s enterprise mobile survey, conducted in September:

- Nearly 75% of the respondents said their IT organizations are supporting employee-owned mobile devices, including smartphones, tablets, netbooks and notebooks.
- A surprising 65% said their IT shops are already supporting *three or more* mobile platforms.

Another finding that shows the wisdom of IT organizations: Some 65% anticipate mobile IT budget increases in the coming year. And the average estimated increase is a fairly significant 19%.

A September 2010 report from Forrester Research sums it up another way: "Most firms have prioritized mobile technology expansion. Mobility is front and center for 62% of CIOs and IT leaders across the globe, with 16% seeing it as a critical priority and 46% seeing it as a high priority."

Most projections show mobile growth continuing well into the new decade. Last month, IDC reported that the third quarter of 2010 marked four successive quarters of growth in handset sales.

But mobile is moving so fast, it's tough to keep tabs on it. In September, IDC said that "heterogeneous device environments are the norm for most enterprises today" and projected that RIM would retain its smartphone market-share lead within businesses in the U.S through 2014. But roughly one month after IDC issued that report, Apple's iPhone shipments topped RIM's BlackBerry shipments.

That volatility also points up why the proliferation of platforms makes supporting mobility complex. But by far the biggest challenge is implementing enterprise mobile security and figuring out some sort of solution for manageability.

Perhaps the most significant of *Computerworld*'s findings is that, of the companies it surveyed, 80% of those with more than 1,000 employees are taking measures to govern which devices and services employees can use, and they're trying to control whether and how those devices can access corporate data.

Those are solid first steps, but despite the good news our survey uncovered, I can't shake the sense of foreboding that fueled my July column. Is all of this enough, or are companies merely scratching the surface?

What does real mobile security look like? Does it involve using good protection with BlackBerry Enterprise Server while taking advantage of the enterprise customizability for iPhones in iOS 4 and punting on employee-owned Android devices? You need solutions that can manage and secure all the mobile devices in your environment, regardless of who owns them.

It's clear from a variety of research sources that IT is opening its eyes to mobile challenges. And that's good news. But I'd like to hear about IT pros' experiences. Drop me an e-mail and let me know how your company is faring when it comes to securing and managing mobility technologies. ◆

Scot Finnie is *Computerworld*'s editor in chief. You can contact him at sfinnie@computerworld.com, and follow him on Twitter (@ScotFinnie).

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